



Information asymmetry and the wealth appropriation effect in the bond market: Evidence from late disclosures[☆]



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ABSTRACT

We examine the effect of an exogenous increase in information asymmetry (as proxied by late filings of firms' Form 10-K) on bond prices. We find that bondholders react negatively to a late filing announcement but this negative reaction is conditional on whether late filing firms appropriate wealth from bondholders through shareholder distribution. Moreover, we find that the impact of financial distress and covenants on bond values is mainly driven by the wealth appropriation from bondholders. The results are robust to difference-in-difference analysis using treatment (i.e., late filing) and control (i.e., non-late-filing) samples based on propensity score matching. The results provide evidence that shareholder distribution as a specific form of wealth appropriation from bondholders to shareholders has a significant effect on bond values when financial information is not timely provided to capital markets.

1. Introduction

It is well known that timely disclosure of periodic financial statement information helps capital market participants make informed investment decisions, which in turn decreases the information asymmetry between managers and investors (e.g., [Glosten & Milgrom, 1985](#); [Hakansson, 1977](#); [Healy & Palepu, 2001](#)). One such vital corporate disclosure is the firm's annual financial filings with the SEC, i.e., the Form 10-K.¹ Recent research on the equity side examining the consequences of an increase in information asymmetry caused by late disclosures of 10-Ks documents negative and significant equity market reaction (e.g., [Bartov, Defond, & Konchitchki, 2015](#)).² In this paper, we

investigate the effect of an exogenous increase to information asymmetry, as proxied by late filing of annual financial statements with the SEC, on bond values.³

We focus on the U.S. bond market for several reasons. First, the U.S. bond market is one of the largest capital markets in the world with over \$9.8 trillion outstanding corporate bonds issued by U.S. firms as of end of 2013.⁴ Second, prior research suggests that the value of debt is less sensitive to asymmetric information than the value of equity because debtholders own a put option on the firm's assets (e.g., [Kerr & Ozel, 2015](#); [Myers & Majluf, 1984](#)). Hence, it is unclear whether the asymmetric information caused by late disclosures will have significant consequences in the bond market. Third, the U.S. bond market is

[☆] Data Availability: Data are publicly available from the sources identified in the study with the exception of the bond data from Lehman Brothers, which is a proprietary dataset.

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¹ In addition to providing detailed and comprehensive financial information not provided by other means (e.g., earnings announcements) to investors, annual financial filings contain management discussion and analysis (MD&A), which evaluates the entity's financial condition based on its past performance, current condition, and future viability.

² Earlier research by [Impink et al. \(2012\)](#), [Griffin \(2003\)](#), and [Alford et al. \(1994\)](#) document similar equity investor reaction to non-timely financial filings.

³ A non-timely (NT) filing provides an additional 15 days for 10-Ks to be filed, and the short extension of actual filing may not be costly ([Bartov & Konchitchki, 2017](#)). Since filing an NT notification certainly raises red flags for capital market that relies on timely financial filings to reduce information asymmetry, late filing can cause a negative shock, while temporarily, to a firm's information environment. In this paper, we use "information asymmetry" in a broad sense of worsened information environment with no intention of referring this term to widened bid-ask spread and decreased number of dealers in the bond market. We thank an anonymous referee for this point.

⁴ Estimates are from the Securities Industry and Financial Markets Association.

dominated by institutional investors, and it is unclear whether bond investors will react to announcements of non-timely SEC filings if these institutional investors can have access to various information sources other than public financial filings (e.g., Defond & Zhang, 2014; Ronen & Zhou, 2013) that can help them anticipate the late filing before it actually occurs. Fourth, announcements of non-timely filings of financial statements may not necessarily trigger bond values downward because late filing firms may agree with bond investors to delay the release of their financial statements by, for example, giving bondholders more leverage over the firm's assets.⁵ Finally, prior research finds that late filing firms are on average smaller, more levered, with lower market to book and profitability (e.g., Bartov et al., 2015). These firms are usually in serious default risk and bondholders may have already priced in such a high level of information asymmetry. Therefore, the findings on the consequences of an increase in information asymmetry caused by late filings previously documented in the equity market may not necessarily hold in the bond market.

In our attempt to answer whether a negative shock to a firm's information environment caused by announcements of late filings matter to bond investors, we argue that bond investors will be more sensitive to late filing announcements as late filing firms transfer wealth from bondholders to shareholders through, for example, dividend payouts and stock repurchases.⁶ Agency theory suggests that bondholders and shareholders in a firm have conflicting interests over dividend policy (Jensen & Meckling, 1976). Dividend payouts can transfer wealth from bondholders to shareholders by reducing the assets available for meeting bondholders' fixed claims and hence increasing the distress risk for bondholders (Ahmed, Billings, Morton, & Stanford-Harris, 2002). Furthermore, the put option of bondholders on the firm's assets will be less valuable as those assets are transferred to shareholders. Prior research also shows that corporate actions that lead to wealth transfer from bondholders to shareholders have a negative impact on bond prices. For example, Warga and Welch (1993) find that bondholders suffer significant wealth losses in leveraged buyouts. Maxwell and Stephens (2003) find negative abnormal bond returns upon announcement of stock repurchases. Hence, we posit that bondholders that are mainly institutional investors will be less concerned with announcements of late disclosures if there is no wealth transfer to shareholders. On the contrary, we posit that bondholders will negatively react to a delay in the release of accounting information to the bond market if the late filing firm appropriate wealth from bondholders, which we refer to as the wealth appropriation effect.

In addition, we argue that the wealth appropriation effect will exacerbate the negative effect of late filing firms' financial distress on bond values. The lower the firms' operating performance and credit quality, the higher would be the uncertainty of firm future cash flows and, as a result, the expected distress risk (Wei & Zhou, 2016). Hence, late filing firms of lower operating performance and poor credit quality will find it difficult to reach an agreement with bondholders to delay the filings of financial statements especially if those late filing firms appropriate wealth from bondholders. Therefore, we posit that the negative reaction of bondholders to the announcements of non-timely annual filings by firms of high distress risk will be stronger when those firms appropriate wealth from bondholders.

Further, we examine the wealth appropriation effect by relating the loss in bond values upon late filing announcements to bond covenants.

⁵ For example, Valeant Pharmaceuticals International Inc. announced in 2016 that it will start talks with its debtholders since it may delay the release of its 2015 annual report. Investors and analysts say that a deal is considered highly likely because most debt investors still believe Valeant is capable of paying its obligations (Goldfarb & Cherny, 2016).

⁶ We acknowledge that there are many forms of wealth appropriation from bondholders to shareholder, one of which is shareholder distribution. Throughout the paper, we only focus on shareholder distribution to examine the wealth appropriation effect.

Debt contracts generally include clauses and covenants that are often based on reported financial statement variables (e.g., balance sheet leverage and earnings-based interest coverage ratios). Nevertheless, the impact of having more covenants on bond values around late filings is not so clear. If more covenants give bondholders a greater protection, bonds with more covenants may suffer less in bond values. In that regard, prior studies have found evidence on the positive impact of having more covenants around some corporate events.⁷ On the contrary, the damage to bond values arising from late filings may increase with covenants if the adoption of covenants is positively correlated with financial distress risk, so that the firms with more bond covenants are just happening to have greater distress risk, ex ante, compared to firms with less bond covenants.⁸ In addition, creditors can use accounting numbers to judge compliance with covenants and to administer lending agreements (Daley & Vigeland, 1983; Defond & Jiambalvo, 1994). Therefore, late filings of firms with more covenants would increase the risk of covenant violations, which can also negatively impact the value of bonds. The damage to bond values can become more severe for firms with a high tension between shareholders and bondholders because the wealth appropriation by shareholders through dividends distribution would worsen the negative impact of distress risk on bond values. It is thus an empirical question of whether more covenants provide a better protection to bondholders of late filing firms or rather serve as an indicator of greater distress risk that can cause more losses in bond values upon late filing announcements.

To empirically examine our conjectures, we take advantage of the SEC's regulatory changes beginning in 2003 to the reporting deadlines whereby firms must file a Form 12b-25 (Form NT "Non-Timely") with the SEC if they cannot file an annual report with the SEC before the new reporting deadlines.⁹ In addition, we use the monthly pricing information from the Lehman Brothers Fixed Income database and daily bond data from the TRACE database covering the period from January 2000 to December 2012. More importantly, we employ a propensity score matching (PSM) technique and create treatment (i.e., the late filing firms) and control groups (i.e., timely filing firms) on several dimensions of firm-specific characteristics using the estimated likelihood of late filing. The counterfactual nature of PSM allows for straightforward and intuitive estimation of late filing and wealth appropriation effects in the bond market with relaxed assumptions regarding the functional relation between default risk, information asymmetry, and bond values. We find a negative and significant reaction in the bond market to the announcements of late filings, but this reaction is conditional on the appropriation of wealth from bondholders through shareholder distributions. In particular, only bonds of late filing firms with high shareholder distribution have a negative reaction. These bonds have experienced on average a negative abnormal return of around 90 bps in late filing announcement month, which is translated into nearly \$10 million loss in bond value. We do not find significant

⁷ For example, Asquith and Wizman (1990) show that pre-buyout bondholders suffer statistically significant wealth losses in leveraged buyouts, but bonds with more covenants (i.e., strong covenant protection) gain value, while those with no covenants lose value.

⁸ Financial distress risk is the risk that a firm cannot meet, or has difficulty paying off, its financial obligations to its debtors. Bratton (2006) find that in the debt market contracting practice correlates directly with the level of financial distress risk and borrowers are sorted according to the degree of that risk, imposing substantial constraints on the borrowers with the greatest financial distress.

⁹ For fiscal years beginning December 15, 2003, SEC (2002, rule 33-8128) accelerated the annual filing deadlines by decreasing the statutory due date from 90 to 75 days for accelerated filers (i.e., firms with market capitalization of at least \$75 million). For fiscal years beginning December 15, 2006, SEC (2005, rule 33-8644) further accelerated the deadline by decreasing the statutory due date from 75 to 60 days for large accelerated filers (i.e., firms with market capitalization of at least \$700 million).

evidence of a decrease in bond values around SEC filing dates among matched firms that also have poor operating performance and low credit quality but timely file their financial statements.

Furthermore, we find that late filing firms with high distress risk suffer a greater loss in bond values when those firms appropriate wealth from bondholders. We also find that bonds with more covenants have lower operating performance and poorer credit quality. Those bonds are more likely to have non-investment grade rating and on average lose more value upon late filing announcements. This finding suggests that the number of covenants is positively correlated with distress risk so that bonds with more covenants become more sensitive to the increase in information asymmetry caused by late financial disclosures. Interestingly, we find that the negative effect of having more covenants on bond values goes away in late filing firms with less wealth appropriation from bondholders to shareholders. We find this negative effect only in firms with more wealth appropriation. Overall, our results show that, when there is an increase in information asymmetry caused by late disclosures, the wealth appropriation from bondholders to shareholders has a significant effect on bond values.

Our study relates to [Gao, Gao, and Smith \(2011\)](#), who examine the consequences of enforcement of bondholder rights on the prices of equity and debt securities in the case of late filings. They focus on the investigation of the selective enforcement of bondholders' rights upon technical default triggered by late filings. Gao et al. find negative abnormal bond returns for their total bond sample, as well as for attacking bonds (i.e., bonds that filed a default notice) and non-attacking bonds, especially for late filings unrelated to option backdating. Hence, their results do not suggest that enforcement of bondholder rights is a factor affecting bond prices. We differ from their study in that we focus on the wealth appropriation from bondholders to shareholders as a conditional factor when examining the relation between bond values and information asymmetry caused by late filings. We also examine how this factor interacts with operating performance and bond covenants in determining the reaction of bondholders to late filings.

Our study contributes to the existing literature in two ways. First, our study broadens our understanding on the role of information asymmetry in the bond market. [Garmaise and Natividad \(2010, p. 2560\)](#) note that “in contrast to the significant and well-established stream of theoretical work on asymmetric information and financial contracting, empirical research in this area is still in a somewhat early stage of development.” In this respect, our study provides new empirical evidence that bond values are sensitive to an increase in information asymmetry caused by late disclosures when late filing firms appropriate wealth from bondholders. Second, prior research on the market consequences of late disclosures is relatively scarce. While the evidence in the equity market shows a negative reaction to late disclosures (e.g., [Alford, Jones, & Zmijewski, 1994](#); [Bartov et al., 2015](#); [Griffin, 2003](#); [Impink, Lubberink, Praag, & Veenman, 2012](#)), our evidence in the bond market shows that bond investors react negatively to late disclosures conditional on having a wealth transfer from bondholders to shareholders. Overall, our results suggest that the wealth appropriation effect is an important factor to account for in studies of information asymmetry in capital markets, particularly in the bond market.

The rest of the paper is organized as follows. [Section 2](#) presents our empirical methodology to estimate bond returns. [Section 3](#) discusses our data sources and the final sample. [Section 4](#) provides our results and [Section 5](#) concludes.

2. Empirical methodology

2.1. Propensity score matching (PSM)

Prior research finds that late filing firms are on average smaller, more levered, with lower market to book and profitability. [Bartov et al. \(2015\)](#) find that return on assets (ROA) is significantly negative for late

10-K filers during the late filing period and in the following two quarters, which suggests that untimely filings convey news about deeper problems and not simply missing an SEC filing deadline. Therefore, a significant reaction around late filing announcement in the bond market, if any, may be due to the high distress risk conveyed in NT filings, not instead the reaction to the worsened information environment caused by late filing per se. To mitigate this concern, we create a control group of firms with similar characteristics that timely file financial statements with SEC so that the only difference between the two sets of firms is that one group (i.e., the control group) is a timely filer (and do not have an exogenous shock to information asymmetry) while the other group (i.e., the treatment group) is not a timely filer (and do have an increased information asymmetry). To form the control group, we first conduct a Logistic regression analysis on late filing indicator for the entire CRSP-Compustat universe with valid bond pricing information. We control for firm and year effects and use a set of firm-specific variables, including size, growth opportunities, profitability, leverage, and credit ratings, in the regression analysis and compute propensity score, i.e., the probability of late filing for each firm-year. We then match each late filing firm with a firm in the same industry (one-digit SIC code) that has the closest propensity score for the same accounting year.

2.2. Bond return

In the equity market, we typically compute abnormal stock returns around a short event window to assess the importance of this event for stock investors. We resemble this event study methodology and apply it to the bond market. Because bond trading is infrequent, prior event studies typically compute abnormal returns during the announcement month using pricing information at the end of each month (e.g., [Maxwell & Stephens, 2003](#)). Specifically, we use the Lehman Brothers Fixed Income (LBFI) dataset covering the years from 2000 to 2006 and the Trade Reporting and Compliance Engine (TRACE) dataset covering the years from 2007 to 2012 to compute bond returns during the announcement month t , which is the month the firm files NT with SEC for late filing firms and the actual filing month for control group. That is,

$$Re_{t_i} = \frac{P_t + AI_t - (P_{t-1} + AI_{t-1}) + C}{P_{t-1} + AI_{t-1}}, \quad (1)$$

where AI is accrued coupon interest, C is the coupon payment received during the month t , P is the (flat) price, which is the month-end bid price in LBFI or the last available daily price (the trade size weighted average of intraday prices) from the last five trading days in that month in TRACE ([Jostova, Stanislava, Alexander, & Christofw, 2013](#)). We then match each bond to the Merrill Lynch monthly bond index segmented by rating and maturity (obtained from Bloomberg) and adjust the raw bond return by index returns to obtain the abnormal bond return (see e.g., [Kecskés, Mansi, & Zhang, 2013](#)). This adjustment approach is different from prior studies including those of [Maxwell and Stephens \(2003\)](#), [Easton, Monahan, and Vasvari \(2009\)](#), and [Gao et al. \(2011\)](#), where the benchmark return is the return from Constant Maturity Treasury with similar maturity. We argue that our approach yields a better risk-adjusted return because the calculated abnormal bond return has purged out the market, rating and maturity effects such that our inference on the bond market reaction to the announcement of late filings is not subject to these compounding effects.

Because the bond market is illiquid, we open a long window of one month and examine bond reactions in the announcement month. The long window analysis could bias against us finding any significance in bond reaction because information other than late filing can also be impounded in bond prices. Nevertheless, a long window analysis can substantially increase the sample size and thus provide convincing results on how bond investors respond to the non-timely filings.

For our empirical methodology, there are additional concerns regarding the use of TRACE database to compute bond returns,

survivorship bias, and potential information leakage around late filing announcements. We address all these issues in robustness checks in Section 4.5.

3. Data and variables measurement

3.1. Data description

We utilize three bond databases in our analysis of the importance of timely filing for bond investors: the Fixed Income Securities Database (FISD), which contains issue details such as ratings and maturity on publicly-offered U.S. bonds from 2000 to 2012, the Lehman Brothers Fixed Income (LBFI) database, which reports month-end bond specific information such as bid price and yield to maturity on nonconvertible bonds that are used in the Lehman Brothers Bond Indexes from 2000 to 2006, and the Trade Reporting and Compliance Engine (TRACE) database, which consolidates daily transaction data on OTC activity from July 2002 to December 2012 that represents over 99% of total U.S. corporate bond market activity in over 30,000 securities.¹⁰ Because the principle approach we adopt in this research is an event study methodology in the bond market, we rely on FISD to obtain issue-specific characteristics and use either TRACE or the LBFI to retrieve monthly bond pricing information. The advantages of using TRACE compared to other sources of bond data is that it is comprehensive dataset that provides actual transaction prices rather than dealer quotes or matrix prices. We follow the standard procedure in the literature to clean this dataset. In particular, we eliminate all trades designated as cancelled, commission, or corrected by TRACE. We also exclude all AAA rated bonds, zero-coupon bonds, floating rate debt, bonds with zero or negative yield spread, bonds with odd frequency coupon payments, and bonds with less than one year to maturity due to their illiquidity and possible data errors (e.g., see Campbell & Taksler, 2003; Bharath & Shumway, 2008).

We obtain our sample of non-timely (NT) filers from the Audit Analytics database for all late filings that are announced between January 2000 and December 2012. Firms that late file their annual financial statements will delay financial disclosures that help investors make informed decisions and, hence, are considered to have greater information asymmetry with investors (Glosten & Milgrom, 1985; Hakansson, 1977; Healy & Palepu, 2001). We also utilize three supporting databases primarily for controls: Compustat database for financial information, CRSP database for stock prices, and IBES database for earnings press releases. For each firm, we use the fiscal year-end as a snapshot to compute accounting variables, in addition to stock and bond specific characteristics. Merging the data and applying these requirements yield a dataset of 229 firm-year observations for late filers covering a sample period from January 2000 through December 2012.

For the set of control firms that have timely filed financial statements with SEC, the actual filing dates are obtained from the S&P Filing Dates Database and Compustat annual tape. These two datasets have a great overlap in reporting filing dates with some minor discrepancies. We combine these two datasets with a careful screen of data error and a full consideration of merges and acquisitions and changes in the issuer name and CUSIP in identifying actual filing dates.

3.2. Variables measurement

The potential for wealth transfer from bondholders to shareholders are likely to be higher for firms that pay dividends to shareholders

¹⁰ Lehman Brothers stopped providing bond pricing data in 2006. All three databases provide the most reliable source for bond pricing information and have been widely used in prior literature (see, e.g., Mansi, Maxwell, & Miller, 2011; Mansi, Maxwell, & Wald, 2009; Bharath & Shumway, 2008; Qi & Wald, 2008; Anderson, Mansi, & Reeb, 2003).

(Ahmed et al., 2002; Jensen & Meckling, 1976). Repurchases, however, have substituted dividends in corporate payout in recent years (Grullon & Michaely, 2002). Therefore, we construct two variables to proxy for the wealth transfer effect or the level of conflict between shareholders and bondholders over distribution policy. The first is a dummy variable that equals one for firms that pay dividends or buy back stocks, zero otherwise. The second is the distribution ratio, which is the sum of dividends and repurchase as a fraction of market cap.¹¹

We extract bond covenant data from the FISD, which reports more than 30 variables on bondholder protective, issuer restrictive, and subsidiary restrictive covenants for each bond issue. Because often there are multiple covenants that restrict the same activity, we group the covenant variables into 22 indicators, which indicate whether a specific type of activity is restricted. Our construction of these covenant indicators is similar to that of Billett, King, and Mauer (2007), who group FISD's covenants into 15 indicators.^{12,13} We create an overall covenant index of bondholder protection by summing the 22 covenant indicators for each bond scaled by 22. By construction, this index is just the sum of one point for the existence of each covenant provision. This methodology makes no distinctions in the strength of protections over bond interest and codes all covenant provisions as simply “present” or “not present”, and thus sacrifices precision for the simplicity necessary to build an index. Some covenant provisions may be stronger than others in protecting bondholders in case of wealth appropriation. Hence, we construct a second covenant variable, namely, a dummy for dividend restriction that equals one if the firm restricts dividend payments to its own shareholders or shareholders of its subsidiaries. Appendix I provides detailed description of all bond covenants used in the sample.

We measure credit ratings using the Standard and Poor's (S&P) rating classifications. The S&P credit rating is computed using a conversion process in which “AAA” rated bonds are assigned a value of 22 and non-rated bonds receive a value of zero. Bonds with credit rating BBB- or above are investment grade (IG) bonds and are non-investment grade (NIG) bonds otherwise.

Firm-specific controls include firm size, market-to-book ratio, leverage, and return on assets. Firm size (*Total Assets*), a proxy for the value of collateral, is the log of book value of total assets. Firm Leverage (*Leverage*), a proxy for financial health, is the ratio of long-term debt scaled by the sum of long-term debt and the market value of equity. Return on assets (*ROA*), a proxy for operating performance and profitability, is the ratio of earnings before interest, tax, depreciation and amortization scaled by book value of assets. Bond-specific characteristics include maturity, covenant index, and credit rating. *Maturity* is number of years until the bond matures (or principal is repaid). Lastly, because the investors' reaction to late filing announcement could depend on whether an earnings press release precedes the delayed filing, we construct a dummy variable, *Preliminary Earnings*, that equals one if the firm has a preliminary earnings disclosure, zero otherwise. Table 1 provides definitions for the variables used in the analysis and their data sources.

3.3. Descriptive statistics

Table 2 provides frequency statistics for the bond sample of non-timely filers. Panel A reports the distribution of event firms by reason.

¹¹ For alternative measures of wealth appropriation and the limitation of using shareholder distribution to proxy for wealth appropriation, see Section 4.5.2.

¹² The additional seven covenant indicators we consider are covenants on liens, restrictions on issuing guarantees, restrictions on transactions with affiliates, preferred stock issuance restrictions, stock transfers restrictions, and covenants requiring minimum earnings and net worth.

¹³ For example, a dividend covenant indicates whether there is a covenant limiting dividend payments by the issuer or a subsidiary of the issuer.

Table 1
Variable definitions.

Variables	Description	Database
Firm-specific variables		
Late dummy	A dummy is one if the firm has filed 10-K NT with the SEC	Audit analytics
Book assets	Book value of assets (in \$ millions).	Compustat
Mktcap	Market cap (in \$ millions)	CRSP
Firm age	Number of years after IPO	CRSP
Beta	Market beta estimated from 5-year monthly returns with a minimum 24 observations	CRSP
Bid-ask spread	The annual average of bid-ask spread divided by the midpoint, in pts	CRSP
Market-to-book	Equity market cap to book ratio	Compustat
ROA	Income before extraordinary items scaled by book assets	Compustat
Leverage	Long term debt divided by book assets	Compustat
Shareholder distribution dummy	One for firm with dividend issuance or stock repurchase, zero otherwise	Compustat
Shareholder distribution ratio	Shareholder distributions (dividend and repurchase) scaled by market cap	Compustat
Preliminary earnings dummy	One if the firm has a preliminary earnings disclosure, zero otherwise.	IBES
Bond-specific variables		
Bond return (pts)	Change in price from last month plus accrued interest scaled by last month price	LBFI, TRACE
Abnormal bond return (pts)	Bond returns adjusted by Merrill Lynch index returns matched by rating and maturity.	Bloomberg
Non-investment grade indicator	One for bonds with non-investment grade rating from S&P, zero otherwise	LBFI, FISD
Maturity	Difference between bond maturity date and bond quote date computed in years.	LBFI, FISD
Restriction-on-distribution	One for bonds with covenant that restricts any shareholder distributions (see Appendix I), zero otherwise	FISD
Covenant index	An index comprised of 22 covenant indicators for each bond. We sum up these indicators and then scale by 22 to obtain the index (see Appendix I for details)	FISD

Table 2
Frequency statistics.

Panel A: incidence of non-timely filings by reason			
Accounting		167	
Corporate events		61	
Multiple		35	
Technical		17	
Total		229	
Panel B: industry distributions for non-timely filers			
SIC			
Code	Industry description	Obs.	(%)
1	Mining and construction	14	6.11
2	Manufacturing (food-petroleum)	21	9.17
3	Manufacturing (plastics-electronics)	91	39.74
4	Transportation and communication	38	16.59
5	Wholesale trade and retail trade	21	9.17
6	Finance and insurance	16	6.99
7	Services (hotels-recreation)	24	10.48
8	Services (health-private household)	4	1.75
	Total firms	229	100%
Panel C: annual distributions for non-timely filers			
	Obs.	(%)	
2000	9	3.93	
2001	13	5.68	
2002	8	3.49	
2003	10	4.37	
2004	24	10.48	
2005	57	24.89	
2006	21	9.17	
2007	39	17.03	
2008	22	9.61	
2009	8	3.49	
2010	6	2.62	
2011	8	3.49	
2012	4	1.75	
Total firms	229	100%	

Table 3
Propensity score match.

Panel A: variable distributions for timely and non-timely filers				
	Timely filers	Non-timely filers	Timely filers	Non-timely filers
Number of firms	9831	229	9831	229
	Mean		Median	
Book assets	26,564	7791 ***	4879	2195 ***
Log (market-to-book)	0.584	0.436 **	0.552	0.516 **
ROA	0.027	−0.025 ***	0.032	0.000 ***
Leverage	0.355	0.456 ***	0.326	0.411 ***
Mktcap	11,773	3389 ***	3144	1039 ***
Preliminary earnings	0.893	0.542 ***	1.000	1.000 ***
Age	26.558	20.794 ***	19.917	13.375 ***
Beta	1.101	1.364 ***	0.962	1.139 ***
Bid-ask spread	0.564	0.691	0.149	0.216 ***
Distribution ratio	0.047	0.087 *	0.026	0.012 ***
Distribution dummy	0.810	0.655 ***	1.000	1.000 ***

Panel B: logistic regression on late filing indicator		Late filing indicator
Log (book asset)		0.053 (0.368)
Leverage		0.631 * (0.064)
ROA		−2.261 *** (0.000)
Log (market-to-book)		−0.238 *** (0.007)
Non-investment grade indicator		1.311 *** (0.000)
Intercept		−14.392 (0.954)
Industry dummy		Yes
Year dummy		Yes
Total observations		10,060
Late filing Obs.		229
Generalized R2 (%)		2.88
Chi-Sq		13.268 **

Panel C: variable distributions for non-timely filers and the matched timely filers				
	Matched timely filers	Non-timely filers	Matched timely filers	Non-timely filers
Number of firms	229	229	229	229
	Mean		Median	
Propensity score	0.056	0.057	0.048	0.049
Book assets	7300	7791	2111	2195
Log (market-to-book)	0.396	0.436	0.437	0.516
ROA	−0.021	−0.025	0.013	0.000 **
Leverage	0.43	0.456	0.400	0.411
Mktcap	3327	3389	1118	1039
Preliminary earnings	0.847	0.541 ***	1.000	1.000 ***
Age	20.293	20.794	13.917	13.375
Beta	1.302	1.364	1.073	1.139
Bid-ask spread	0.697	0.691	0.176	0.216 *
Distribution ratio	0.065	0.087	0.020	0.012
Distribution dummy	0.703	0.655	1.000	1.000

Based on the two-tailed test of the differences in means and the Wilcoxon rank sum test of the differences in distributions under the null of asymptotically normal distribution.

*** Indicates statistical significance at 1% level.

** Indicates statistical significance at 5% level.

* Indicates statistical significance at 10% level.

Table 4
The announcement effect for late filers and matched timely filers.

	Abnormal bond return (%)	# Bonds
Matched timely filers	-0.10 (-0.38)	499
Late filing firms	-0.61 (-3.18) ***	445
Difference	-0.51(2.43) **	
By late filing reasons		
Accounting	-0.49(-2.48) **	347
Corporate events	-0.72 (-1.46)	114
Multiple	-0.74 (-1.14)	64
Technical	0.17 (0.12)	26

Late filing firms are not only required to complete Form NT but also report to the SEC the reasons for requesting an extension to delay the filing of their financial statements. The most common reason chosen by firms are accounting and corporate events. Accounting reasons are related to issues such as internal control problems, accounting irregularities, or investigation by the SEC. Corporate events are related to issues such as de-registration, going private transactions, restructuring, or mergers and acquisitions. We note that, while we have 229 late filing announcements, firms can list more than one reason in their NT forms.

Panel B of Table 2 provides the industry distribution of the sample firms in absolute number as well as in percentage using the standard SIC codes for non-timely filing firms. Industries in the sample include: mining and construction, manufacturing (food, petroleum, plastics, and electronics), transportation and communications, wholesale and retail trade, finance and insurance, and services (hotels, recreation, health, and private household). A large portion of firms concentrates in manufacturing (49%), transportation and communication (17%), and services (12%). Panel C of Table 2 provides the annual distribution of the sample firms. Late filing occurrence has decreased over time, with nearly 50% of the observations clustering around the period of 2004–2007. The uneven distribution across industries and over time series highlights the importance of controlling for industry and year effects in all regression analyses.

Table 3 conducts Logistic regression analysis on late filing indicator for the entire CRSP-Compustat universe with valid bond pricing information. We focus on firms with public bonds outstanding because these firms are usually large in size and have similar capital structure and covenant protections for bond holders, and therefore, for each event firm we are more likely to be able to find a good match with similar default risk. Panel A of Table 3 provides summary statistics on firm-specific variables for sample firms that file and do not file NT with SEC for their annual financial statements. Late filing firms are less profitable with higher leverage and poorer credit quality than time filing firms. Overall, these findings are consistent with those of prior research (e.g., Alford et al., 1994). Among time filers, there are 81% of firms that pay dividends or buyback stocks, and 89% of firms that release earnings before SEC filings, with the average shareholder distribution ratio being 4.7%. In comparison, for late filing firms, these numbers are 65%, 54%, and 8.7%, respectively. While a less number of late filing firms have shareholder distribution, these that do distribute have returned a significant amount of capital to shareholders and thus potentially have higher conflict of interest between shareholders and bondholders among these firms. It is thus interesting to explore whether shareholder distribution, as a specific form of wealth appropriation, can have an impact on bond values when these firms do not timely file with SEC.

Panel B of Table 3 reports Logistic regression results, where we use late filing indicator as the dependent variable and a number of firm-specific characteristics that are likely related to late filing decisions as independent variables, including book asset, market-to-book ratio, ROA, leverage, and a dummy for non-investment-grade rating. We also control for year and industry effects. Largely as expected, high leverage, poor operating performance, less growth opportunity, and low credit

quality are all significant indicators of late filing announcement. The model has a good fit statistics with a Chi-square statistic of 13.268, which is significant at 1% level.

We use the parameter estimate from Panel B to compute probability of late filing, which is typically labelled propensity score in the literature, for each firm in the regression. After that, we identify a matched firm for each late filing firm as the one in the same industry (one-digit SIC code) that has timely filed with SEC during the same accounting year with the closest propensity score. This match rule controls for the difference across year and industry and also takes a full consideration of important effect of firm-specific variables on late filing decisions. Panel C of Table 3 reports the mean and median of late filing firms and the matched time filing firms. Note that the summary statistics for late filing firms are just copied from Panel A for the ease of composition. It is shown that nearly all firm-specific characteristics, including book asset, leverage, and ROA that together can reflect a firm's financial default risk, are quite similar between matched and event firms with no significant difference across these two samples, suggesting that our Logistic regression analysis and the matching algorithm have successfully removed the material difference in financial distress risk between late filing and matched timely filing firms.

4. Empirical results

4.1. Unconditional results on announcement effect

Table 4 reports the abnormal bond returns during the announcement month for late filing firms and during the filing month for matched timely filing firms. Based on our sample of 445 bonds that we have complete bond pricing information in the beginning and the end days of the announcement month, Panel A shows that non-timely filing firms experience a negative and significant (at the 1% level) abnormal bond returns of 61 basis points during the announcement month. This loss in value is quite economically significant. The sample bonds have an average outstanding value of \$897 million. An abnormal return of 61 basis point is translated into a loss in bond value of \$5.5 million during the announcement month of late filing.¹⁴ On the contrary, the 499 bonds of timely filing firms that have nearly the same financial distress risk and firm-specific characteristics as late filing firms do not have significant abnormal returns during the month the firm files with SEC. The difference of 51 bps abnormal bond returns between timely and non-timely filing firms (significant at 5% level) is evidence that late filing announcement conveys information that is beyond financial default risk and is important for bond investors.¹⁵

When we segment the late filing sample by reasons, most of the losses occur in firms that report accounting reasons and corporate events as the primary issues for such delays.¹⁶ In terms of economic significance, the bonds of late filers that report accounting reasons for the delay lose about 49 basis points, while those that report corporate events as reasons for the delay lose about 72 basis points.

¹⁴ We also want to point out that abnormal bond returns are usually below 20 bps in the announcement month of a typical corporate event. For example, Maxwell and Stephens (2003) report 12–18 bps abnormal bond returns during the announcement month of stock repurchase.

¹⁵ We also consider potential compounding effect during the announcement month. Some corporate events such as acquisitions and rating downgrades may also trigger a negative bond market reaction. We do not find any firms in our final sample that have such announcements in the event month. We find only one bond where the late filing firm has an earnings release in the event month and removal of this bond does not affect our reported results.

¹⁶ The late filing firm usually does not disclose the exact reason for late filing and they just mention “accounting reason” or “corporate events.”

Table 5
The wealth appropriation effect for late filing firms and matched timely filing firms.

Wealth appropriation	Abnormal bond ret (%)	# Bonds	Abnormal bond ret (%)	# Bonds	Difference
	Matched timely filers		Non-timely filers		
No distribution firm	-0.12 (-0.27)	116	0.20 (0.79)	154	0.32 (0.53)
Distribution firm	0.10 (0.79)	383	-0.87 (-3.31) ***	291	-0.97 (-2.08) **
○Difference	0.22 (0.74)		-1.07 (-1.99) **		-1.29 (-2.21) **
Low distribution ratio	-0.06 (-0.24)	254	-0.10 (-0.85)	222	-0.16 (-0.32)
High distribution ratio	0.16 (0.81)	245	-0.99 (-3.02) ***	223	-1.15 (-2.79) ***
Difference	0.22 (0.84)		-0.89 (-1.85) *		-1.12 (-2.16) **

*** Indicates statistical significance at 1% level.

** Indicates statistical significance at 5% level.

* Indicates statistical significance at 10% level.

4.2. Wealth appropriation around late filing announcement

We argue that bondholders will negatively react to the increase in information asymmetry due to late filing of financial statements if the late filing firm appropriate wealth from bondholders (wealth appropriation effect). In Table 5, we divide the event and controls samples, respectively, based on two wealth appropriation measures. We find that for late filing firms, as reported in the right half of Table 5, only bonds of firms that have shareholder distribution and firms that have high shareholder distribution ratios (i.e., above the sample median) exhibit significant and negative abnormal returns during the announcement month. Bonds of late filing firms that do not have shareholder distribution or have less shareholder distributions do not have significantly negative abnormal returns. For example, the bonds of firms that have shareholder distribution incur an average loss of 87 bps (i.e., \$9.5 million) during the late filing announcement month, and those that do not have shareholder distribution experience negligible change in bond values (an increase of 20 bps). The difference in abnormal returns between the bonds that have shareholder distribution (or have high distribution ratio) and those that do not have shareholder distribution (or have low distribution ratio) is statistically significant at the 5% level. Firms that have shareholder distribution or have more distributions to shareholders suffer from a high potential for wealth appropriation from bondholders and, as a result, bondholders react significantly negatively to the increase in information asymmetry due to late filings of financial statements.

On the contrary, for the matched timely filing sample, as reported in the left half of Table 5, wealth appropriation does not seem to have any impact on bond values upon the firm files annual financial statements with SEC, even though these firms also have similar firm-specific characteristics that are indicative of as high financial default risk as late filing firms. For example, the difference in abnormal bond returns between firms that have shareholder distribution and those that do not have is 22 bps, which is insignificant at any conventional levels. The difference in difference in abnormal bond returns between late filing and timely filing matched firms is 129 bps when using shareholder distribution indicator to proxy for wealth appropriation. The number is 112 bps when using distribution ratio to measure wealth appropriation. Both numbers are significant at 5% level. These results suggest that wealth appropriation has exaggerated the negative impact on bond values of the shock to a firm's information environment caused by late filing announcement.

To further test wealth appropriation effect on bond values, in Table 6, we conduct a regression analysis on abnormal bond returns for late filing firms (Model 1), for matched timely filing firms (Model 2), and for both (Model 3). In all models, we include four firm-specific controls: *Log (Total Assets)*, *ROA*, *Leverage*, and *Preliminary Earnings*. We also include three bond-specific controls: *Covenant Index*, *NIG dummy*, and *Maturity*. We lag all firm- and bond-specific controls to weaken endogeneity concerns. To run the regression, we use heteroskedastic

consistent standard errors following White (1980) and we cluster standard errors at the firm level as in Petersen (2009). In models 1 and 2, our primary regression model is as follows:

$$\begin{aligned} \text{Abnormal Bond Ret} = & B_0 + B_1(\text{Wealth Appropriation}) + B_{4-6}(\text{Firm Specifics}) \\ & + B_{7-9}(\text{Bond Specifics}) + \sum B(\text{Industry}) + \sum B(\text{Year}) \end{aligned} \quad (2)$$

The primary variable of interest is B1, the coefficient estimate of wealth appropriation variables, which are measured by shareholder distribution dummy and distribution ratio respectively. We find that B1 is always significant and negative for late filing firms, after controlling for many firm-specific and bond-specific variables that are usually associated with default risk and credit quality. For example, the bonds of firms with shareholder distribution lose 131 bps in value compared to firms that do not have shareholder distribution. This loss is significant both statistically and economically and also quite close to the difference of 107 bps between shareholder distribution and non-distribution firms as reported in Table 5 for univariate analysis. We also find that B1 is slightly positive though insignificant for matched timely filing firms. This evidence is also consistent with the univariate analysis in Table 5 where shareholder distribution does not have an impact on abnormal bond returns when the firm timely files with SEC.

In Model 3, we combine late filing event firms and non-late filing matched firms and include a Late Dummy variable and an interaction term of Late dummy with wealth appropriation variables. In particular, the regression model is as follows

$$\begin{aligned} \text{Abnormal Bond Ret} = & B_0 + B_1(\text{Wealth Appropriation}) + B_2(\text{Late Dummy}) \\ & + B_3(\text{Wealth Appropriation} \times \text{Late Dummy}) + B_{4-6}(\text{Firm Specifics}) \\ & + B_{7-9}(\text{Bond Specifics}) + \sum B(\text{Industry}) \\ & + \sum B(\text{Year}) \end{aligned} \quad (3)$$

The variable of interest is B3, the coefficient estimate on the interaction term of Late Dummy with wealth appropriation variables. If shareholder distribution makes bond investors much worse around late filing announcement, we expect to see a significant and negative B3 when we combine event and control firms and conduct regression analysis. We indeed find B3 is significant and negative at conventional levels in Model 3. This evidence provides further support to our conjecture that bondholders react negatively to the increase in information asymmetry due to late filing of financial statements if the late filing firm appropriate wealth from bondholders.¹⁷

In all models, in addition to ROA (multiplied by minus one for ease of interpretation), we use leverage and NIG to control for financial distress risk. Therefore, our finding that firms with high wealth

¹⁷ To mitigate a potential concern that the results are driven by high firm risk or low profitability, we also interact each individual control variables with Late Filing Dummy and include these additional variables in the regression. Our results are robust to this alternative specification (unreported).

Table 6
Multivariate regression analysis on wealth appropriation effect.

	(1)	(2)	(3)	(4)	(5)	(6)
	Non-timely	Matched	Combined	Non-timely	Matched	Combined
Late dummy			0.782 (1.15)			0.127 (0.28)
Distribution dummy	−1.31 (−2.84) ***	1.71 (1.05)	1.025 (1.34)			
Late dummy × distribution dummy			−1.87 (−2.19) **			
Distribution ratio				−1.44 (−2.54) **	4.901 (1.49)	3.537 (1.44)
Late Dummy × distribution ratio						−4.91 (−1.93) *
ROA	−6.21 (−2.47) **	−13.3 (−2.56) **	−8.59 (−2.79) ***	−5.09 (−1.87) *	−15.2 (−3.04) ***	−8.59 (−2.86) ***
Log (book assets)	−0.17 (−0.84)	−0.19 (−0.74)	−0.16 (−1.01)	−0.14 (−0.67)	−0.14 (−0.53)	−0.12 (−0.77)
Leverage	−2.04 (−1.6)	−3.83 (−2.06) **	−2.9 (−2.75) ***	−1.04 (−0.82)	−3.94 (−2.13) **	−2.34 (−2.19) **
Preliminary earnings	0.289 (0.79)	1.817 (1.29)	0.675 (1.23)	0.175 (0.5)	1.805 (1.27)	0.516 (0.96)
Non-investment grade indicator	−0.41 (−0.73)	2.21 (1.7) *	0.895 (1.22)	−0.07 (−0.11)	2.011 (1.54)	0.847 (1.14)
Maturity	−0.08 (−2.77) ***	−0.01 (−0.19)	−0.03 (−1.53)	−0.08 (−2.52) **	−0.01 (−0.23)	−0.03 (−1.46)
Covenant index	−0.53 (−0.32)	1.144 (0.57)	0.551 (0.41)	−0.47 (−0.28)	1.123 (0.56)	0.733 (0.54)
Intercept	3.544 (1.12)	0.69 (0.12)	1.64 (0.48)	1.108 (0.35)	0.777 (0.14)	1.104 (0.34)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Sq. (%)	0.222	0.187	0.108	0.234	0.187	0.116
# Obs.	445	499	944	445	499	944

*** Indicates statistical significance at 1% level.

** Indicates statistical significance at 5% level.

* Indicates statistical significance at 10% level.

appropriation have more negative abnormal bond returns around late filing announcements is less likely to be driven by financial distress risk.¹⁸

4.3. Wealth appropriation and distress risk

So far we find that the negative abnormal bond returns upon late filing announcements are mainly driven by firms with a greater wealth appropriation from bondholders to shareholders as measured by shareholder distribution. In this sub-section, we examine how this wealth appropriation effect will matter to firms with high financial distress risk, i.e., poor operating performance and low credit quality. We argue that the negative reaction of bondholders to late filing announcements by firms of lower operating performance and poor credit quality will be stronger when these late filing firms appropriate wealth from bondholders. Some of the firm- and bond-specific characteristics could confound our evidence. For this reason, we conduct a multivariate analysis for late filing firms.¹⁹ Our primary regression model is as follows:

$$\begin{aligned}
 \text{Abnormal Bond Ret} = & B_0 + B_1(\text{WealthAppropriation}) + B_2(\text{DistressRisk}) \\
 & + B_3(\text{WealthAppropriation} \times \text{DistressRisk}) \\
 & + B_{4-6}(\text{FirmSpecifics}) \\
 & + B_{7-9}(\text{Bond Specifics}) + \sum B(\text{Industry}) + \sum B(\text{Year})
 \end{aligned}
 \tag{4}$$

As in Table 6, we include some firm-specific controls and bond-specific controls. We also lag all firm- and bond-specific controls to weaken endogeneity concerns and use heteroskedastic-consistent standard errors following White (1980) and cluster standard errors at the

¹⁸ Since nearly 25% of event firms are in 2005, which is the year that firms first start to comply with Sarbanes Oxley Section 404 (i.e., the memo on the internal control over financial reporting), we conduct additional robustness tests. In the first test, we exclude all observations of year 2005 from the sample. In the second test, we create a new indicator variable that equals one if the firm ultimately issues a material weakness in internal control over financial reporting when the Form 10-K is filed with the SEC and include this indicator variable in the regression. Our results remain robust in both tests (unreported).

¹⁹ We only report the regression results for late filing sample in Tables 7 and 8. For non-late filing matched firms, we do not find wealth appropriation effect and results are thus omitted.

firm level as in Petersen (2009). We divide the sample into two groups based on shareholder distribution dummy and the sample median distribution ratio, respectively, and then use the dummy for shareholder distribution (Models 1 and 3) and the dummy for high distribution ratio (Models 2 and 4) to measure wealth appropriation. We use ROA (Models 1 and 2) and NIG (Models 3 and 4) to measure distress risk. For ease of interpretation, we multiply ROA by minus one so that a greater value implies poor operating performance and high distress risk.

The variable of interest is B3, the interaction term of wealth appropriation with distress risk variables. If wealth appropriation effect is the main driver for the negative reaction of bondholders to late filing announcements and wealth appropriation exacerbates the negative effect of late filing firm's high distress risk on bond values, one would expect to see a significant and negative coefficient estimate B3. We indeed find that B3 is significant and negative in all models. For example, in Model 4, the coefficient estimate on the interaction term of NIG and high distribution ratio dummy is −1.88 and it is significant at the 5% level. Therefore, the NIG bonds lose 188 bps more than investment-grade bonds if the issuing firms have above average shareholder distribution ratios. This evidence provides support to our argument that the wealth appropriation effect exacerbates the negative effect of late filing firms' high distress risk on bond values.

4.4. Wealth appropriation and covenants

As discussed earlier, an interesting question that arises is what role bond covenants would play in the event of late disclosures. If covenants are independent of financial distress risk and can protect bondholders effectively, we would expect no significant correlation between covenants and distress risk. As a result, we would also expect the loss in bond values due to late filings to be less for bonds with more covenants. On the contrary, if more covenants are originally (i.e., ex ante) required for bonds of greater distress risk, we would expect a significant correlation between the number of covenants and distress risk. Hence, bonds with more covenants are expected to lose more value upon late filing announcements compared to bonds with less covenants.

In untabulated results, we first conduct a univariate analysis to examine the distress risk (via operating performance and credit rating) in the cross section of bond covenants. We group sample bonds into two subsamples based on the number of covenants and whether the bond has a distribution restriction in its covenants. Our results show that

bonds with more covenants and bonds with distribution restriction tend to have poorer operating performance, lower credit quality and more likely to be non-investment grade bonds. This evidence suggests that covenants are originally (i.e., ex ante) added to debt contracts so that bonds with a greater financial distress risk tend to have more covenants (especially those that restrict shareholder distributions). Accordingly, we conjecture that bonds with more covenants will suffer more losses upon late filing announcements because those bonds of higher distress risk will be more sensitive to the increase in information asymmetry caused by late filings. That is, the wealth appropriation effect on bond values that we have previously documented will exacerbate the negative effect of covenants around late filing announcements.

To test this conjecture, we conduct a multivariate regression analysis in Table 8. Hence, we rerun Eq. (4) after replacing ROA and NIG with *Covenant Index* (or *Restriction-on-Distribution Dummy*). Specifically, we estimate the following regression:

$$\begin{aligned} \text{Abnormal Bond Ret} = & B_0 + B_1(\text{Wealth Appropriation}) + B_2(\text{Covenant Index}) \\ & + B_3(\text{Wealth Appropriation} \times \text{Covenant Index}) + B_{4-7}(\text{Firm Specifics}) \\ & + B_{8-10}(\text{Bond Specifics}) + \sum B(\text{Industry}) + \sum B(\text{Year}) \end{aligned} \quad (5)$$

As in Eqs. (2)–(4), we lag all firm- and bond-specific controls to weaken endogeneity concerns. The results are reported in Table 8 with two interesting findings. First, the coefficient estimates on the wealth appropriation and covenants, B_1 and B_2 , are not significant in most of the models. Second, the coefficient estimate on the interaction between wealth appropriation and covenants, B_3 , is consistently negative and significant across all models. For example, in Model 3, if the late filing firm have shareholder distribution and the bond includes covenants with restriction on shareholder distribution, then an average loss in bond value of 187 bps is observed during the late filing announcement month. The significant negative abnormal returns for late filing firms are mainly driven by a subsample of firms with more covenants (or include covenants with shareholder-distribution restriction) and with high potential for wealth transfer from bondholders to shareholders through shareholder distribution. Overall, the multivariate regression results of Table 8 suggest that having more covenants will negatively impact bond values when late filing firms appropriate wealth from bondholders. Bonds with more covenants are negatively affected by the asymmetric information caused by financial filing delays, and the wealth appropriation effect exacerbates, or even drives, this negative effect.

4.5. Robustness checks

4.5.1. Alternative methodology for computing bond returns

Our event study uses LBF1 and TRACE databases for bond pricing information to compute bond returns. When using LBF1 on and before 2006, all event bonds are included in the study because we typically have pricing information for event and prior months. As a result, we do not have the issue of missing observations before 2006. When using TRACE database for sample period after 2006, while we follow the convention in the literature (Jostova et al., 2013) and use the bond price observed in the last five trading days of the month to compute bond returns, there is a potential survivorship bias in the sample. If the bonds of event firms are not traded in the last five days of the event month or the prior month, we cannot compute bond returns for these bonds and these bonds will be excluded from the empirical analysis. To alleviate this concern, for the sample period after 2006, we first identify 181 event bonds that have valid pricing information and are thus in our final sample and 149 event bonds that do not have valid pricing information and are thus excluded from our final sample. We then verify that the final sample is representative of the original total sample (i.e., all the event bonds, with and without valid pricing information). Both samples have similar distributions by bond-specific characteristics, including rating, maturity, amount outstanding, and covenants. These

two samples also have similar firm-specific characteristics such as leverage, ROA, and book assets. To further alleviate the concern of survivorship bias, we also follow Hand, Holthausen, and Leftwich (1992) and use a longer event window of up to 60 days which extends from the last price before the announcement till the first price after the announcement to measure the bond return associated with the event. Doing so increases the sample size and similar results are obtained that are omitted for brevity.

We also consider another potential concern related to the use of TRACE database for bond pricing information. If the late filing announcement happens in the last one or two days of the event month but the last available price for that month is before the announcement date, then the monthly returns computed during the event month will not capture the market reaction around the event date. There are 17 event bonds in our sample that have announcement date at the end of month and the last observed price in that month is before the announcement date. We remove these 17 bonds and we find results (omitted for brevity) similar to those reported in the paper.

A third concern related to our methodology for computing bond returns is the possibility of having information leakage before the late filing announcement. For example, bond investors are typically sophisticated investors and they may have anticipated the late filing event before it actually happens. It is also possible that the late filing announcement can be made in the first one or two days of the event month so that some of the bond market reaction have actually happened in the prior month. To alleviate those concerns, we compute abnormal bond returns during the announcement month and the month before. We still obtain similar results (not reported) and our conclusions remain qualitatively valid. An NT (non-timely) filing provides an additional 15 days for 10-Ks to be filed. Around 20% of our late filing sample firms do file their annual financial statements within the grace period, and out of these 20% firms, there are five firms whose late filing announcement date and the actual filing dates are in the same month. We remove these five firms from our sample and do not find the results are materially altered.

4.5.2. Alternative measures of operating performance and wealth appropriation

In our tests, we use ROA and NIG to measure operating performance and proxy for financial distress risk. Because ROA can vary by industry, we subtract sample firm's ROA by the industry median ROA based on the 2-digit SIC codes. We obtain similar results (untabulated) to those reported in Tables 6 and 7. Alternatively, we use a comprehensive measure of distress risk as in Campbell, Hilscher, and Szilagyi (2008) and redo the tests and find similar results (untabulated). We also follow Bharath and Shumway (2008) and compute DD (distance-to-default) and predicted probability of default based on Merton (1974) structural bond pricing model. Using DD as an alternative measure of distress risk, our findings are in general robust but slightly less significant.

For wealth appropriation measure, we also use dividends without the inclusion of stock repurchase as an alternative measure and obtain similar and significant results (untabulated). We notice that prior research also uses high dividend payments as a proxy for financial constraints because dividends are sticky and not really discretionary. This could create a problem for our argument that the abnormal bond returns upon late filing announcement is not because of distress risk but instead because of wealth appropriation. Ideally we would like to use alternative measures such as stock repurchases and R&D expenditures that benefit shareholders directly but are relatively discretionary in nature. Unfortunately, our sample size is relatively small and more than 90% of our sample firms do not have R&D or stock repurchases. This creates a problem for most of our tests. Therefore, our results on wealth appropriation effects can only be valid up to the extent that shareholder distribution and stock dividends in particular are a good measure of wealth appropriation from bondholders to shareholders. We caution the readers that our results can have an alternative interpretation if

Table 7
Multivariate regression analysis: wealth appropriation and financial distress risk.

	(1)	(2)	(3)	(4)
Distribution dummy	-0.56 (-1.29)		-0.95 (-1.22)	
Distribution dummy × ROA	-8.6 (-1.84) *			
Distribution dummy × non-investment grade indicator			-1.42 (-2.06) **	
High distribution ratio		-0.40 (-0.96)		-0.32 (-1.34)
High distribution ratio × ROA		-13.4 (-2.78) ***		
High distribution ratio × non-investment grade indicator				-1.88 (-2.14) **
ROA	-0.94 (-0.3)	-0.35 (-0.14)	-6.2 (-2.46) **	-4.45 (-1.65) *
Log (book assets)	-0.2 (-0.95)	-0.28 (-1.35)	-0.17 (-0.81)	-0.09 (-0.45)
Leverage	-1.71 (-1.33)	-1.33 (-1.07)	-2 (-1.53)	-1.26 (-1.03)
Preliminary earnings	0.277 (0.74)	0.056 (0.16)	0.282 (0.77)	0.175 (0.49)
Non-investment grade indicator	-0.19 (-0.33)	-0.23 (-0.37)	-0.13 (-0.18)	0.766 (1.26)
Maturity	-0.08 (-2.73) ***	-0.09 (-2.83) ***	-0.08 (-2.7) ***	-0.07 (-2.25) **
Covenant index	-0.68 (-0.41)	-1.03 (-0.61)	-0.55 (-0.33)	0.014 (0.01)
Intercept	3.033 (0.96)	3.412 (1.1)	3.265 (1)	-0.26 (-0.08)
Industry effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
Adj. R-Sq. (%)	0.229	0.262	0.222	0.246
# Obs.	445	499	445	499

*** Indicates statistical significance at 1% level.

** Indicates statistical significance at 5% level.

* Indicates statistical significance at 10% level.

shareholder distribution is closely linked to financial constraints.

5. Conclusion

Motivated by the importance of timely disclosure of financial information in reducing information asymmetry in capital markets and by the limited research on the consequences of filing late financial statements with the SEC in the bond market, we examine the effect of firm's non-timely disclosure of financial information on bond values. We document that bondholders react negatively to the information asymmetry caused by late disclosures but this negative reaction is conditional on whether late filing firms appropriate wealth from bondholders through dividend payouts. Furthermore, we document that this act of wealth appropriation from bondholders to shareholders drives the impact of financial distress and covenants on bond values.

Our evidence suggests that when financial information is not timely

provided to the capital markets, the wealth appropriation from bondholders has an important first-order effect on bond values. Overall, our results suggest that the value of debt is more sensitive to information asymmetry conditional on having wealth appropriation from bondholders and, therefore, enhance our understanding of the causal effect of information asymmetry on bond values.

Our study contributes to the existing literature in two ways. First, our study provides new evidence on the relation between information asymmetry caused by late disclosures of financial information and bond values. Second, our study contributes to the growing literature on the consequences of late SEC filings and show that bond investors, who are mainly institutional investors with access to various sources of information, react negatively to late disclosures of financial information conditional on having a wealth appropriation from bondholders to shareholders.

Table 8
Multivariate regression analysis: wealth appropriation and covenants.

	(1)	(2)	(3)	(4)
Distribution dummy	-0.33 (-0.67)		-0.33 (-0.67)	
Distribution dummy × covenant index	-1.82 (-2.23) **			
Distribution dummy × restriction-on-distribution dummy			-1.87 (-2.21) **	
High distribution ratio		-0.13 (-0.27)		-0.15 (-0.32)
High distribution ratio × covenant index		-1.72 (-2.09) **		
High distribution ratio × restriction-on-distribution dummy				-1.73 (-2.01) **
Restriction-on-distribution dummy			0.396 (0.49)	0.384 (0.47)
ROA	-6.12 (-2.46) **	-5.82 (-2.27) **	-6.17 (-2.51) **	-5.89 (-2.32) **
Log (book assets)	-0.18 (-0.88)	-0.17 (-0.83)	-0.19 (-0.91)	-0.18 (-0.86)
Leverage	-2 (-1.56)	-1.98 (-1.55)	-1.9 (-1.46)	-1.88 (-1.43)
Preliminary earnings	0.231 (0.64)	0.188 (0.51)	0.23 (0.63)	0.195 (0.52)
Non-investment grade indicator	-0.36 (-0.66)	-0.31 (-0.51)	-0.25 (-0.45)	-0.2 (-0.33)
Maturity	-0.08 (-2.74) ***	-0.09 (-2.84) ***	-0.08 (-2.56) **	-0.08 (-2.66) ***
Covenant index	0.638 (1.42)	0.562 (1.22)	0.463 (0.16)	0.169 (0.06)
Intercept	3.132 (1.14)	2.478 (0.92)	2.949 (0.88)	2.374 (0.72)
Industry effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
Adj. R-Sq. (%)	0.232	0.224	0.233	0.224
# Obs.	445	445	445	445

*** Indicates statistical significance at 1% level.

** Indicates statistical significance at 5% level.

Appendix I

Construction of bond covenant index using the FISD database.

Covenant indicator	FISD covenants	FISD definition of covenants
Dividend payment	Dividends related payments	Flag indicating that payments made to shareholders or other entities may be limited to a certain percentage of net income or some other ratio
	Subsidiary dividends related payments	Limits the subsidiaries' payment of dividends to a certain percentage of net income or some other ratio. For captive finance subsidiaries, this provision limits the amount of dividends which can be paid to the parent. This provision protects the bondholder against a parent from draining assets from its subsidiaries.
Other payment	Restricted payments	Restricts issuer's freedom to make payment (other than dividend related payments) to shareholders and others
Funded debt	Subsidiary funded debt	Restricts issuer's subsidiaries from issuing additional funded debt (debt with an initial maturity of longer than one year)
	Funded debt	Restricts issuer from issuing additional funded debt. Funded debt is an debt with an initial maturity of one year or longer
Subordinated debt	Subordinated debt issuance	Restricts issuance of junior or subordinated debt
Senior debt	Senior debt issuance	Restricts issuer to the amount of senior debt is may issuer in the future
Secured debt	Negative pledge covenant	The issuer cannot issue secured debt unless it secures the current issue on a pari passu basis
Indebtedness	Indebtedness	Restricts user from incurring additional debt with limits on absolute dollar amount of debt outstanding or percentage total capital
	Subsidiary indebtedness	Restricts the total indebtedness of the subsidiaries
	Leverage test	Restricts total-indebtedness of the issuer
	Subsidiary leverage test	Limits subsidiaries' leverage
Leaseback	Sales leaseback	Restricts issuer to the type or amount of property used in a sale leaseback transaction and may restrict its use of the proceeds of the sale. A sale leaseback transaction is a method of raising capital in which an organization sells some specific assets to an entity that simultaneously leases the asset back to the organization for a fixed term and agreed upon rate.
	Subsidiary sales leaseback	Restricts subsidiaries from selling then leasing back assets that provide security for the debtholder. This provision usually requires that assets or cash equal to the property sold and leased back be applied to the retirement of the debt in question or used to acquire another property to increase the debtholders' security
Liens	Liens	In the case of default, the bondholders have the legal right to sell mortgaged property to satisfy their unpaid obligations
	Subsidiary liens	Restricts subsidiaries from acquiring liens on their property
Guarantee	Subsidiary guarantee	Subsidiary is restricted from issuing guarantees for the payment of interest and/or principal of certain debt obligations
Transaction Investment	Transaction affiliates	Issuer is restricted in certain business dealings with its subsidiaries
	Investments	Restricts issuer's investment policy to prevent risky investments
	Subsidiary investments unrestricted	Restricts subsidiaries' investment
Asset sales	Asset sale clause	Covenant requiring the issuer to use net proceeds from the sale of certain assets to redeem the bonds at par of at a premium. This covenant does not limit the issuers right to sell assets
	Sale assets	Restriction on the ability of an issuer to sell assets or restrictions on the issuer's use of the proceeds from the sale of assets. Such restrictions may require the issuer to apply some or all of the sales proceeds to the repurchase of debt through a tender offer or call.
	Subsidiary sale assets unrestricted	Issuer must use proceeds from sale of subsidiaries' assets (either certain asset sales or all asset sales over some threshold) to reduce debt.
Common stock	Stock issuance	Restricts issuer from issuing additional common stock
	Subsidiary stock issuance	Restricts issuer from issuing additional common stock in restricted subsidiaries. Restricted subsidiaries are those which are considered to be consolidated for financial test purposes.
Preferred stock	Subsidiary preferred stock issuance	Restricts subsidiaries' ability to issue preferred stock
Other stock	Stock transfer sale	Restricts the issuer from transferring, selling, or disposing of its own common or the common stock of a subsidiary
Default	Cross acceleration	A bondholder protective covenant that allows the holder to accelerate their debt, if any other debt of the organization has been accelerated due to an event of default
	Cross default	A bondholder protective covenant that will activate an event of default in their issue, if an event of default has occurred under any other debt of the company

Poison put	Change control put provisions	Upon a change of control in the issuer, bondholders have the option of selling the issue back to the issuer (poison put). Other conditions may limit the bondholder's ability to exercise the put option. Poison puts are often used when a company fears an unwanted takeover by ensuring that a successful hostile takeover bid will trigger an event that substantially reduce the value of the company
Merger Earnings	Consolidation merger	Indicates that a consolidation or merger of the issuer with another entity is restricted
	Fixed charge coverage	Issuer is required to have a ratio of earnings available for fixed charges, of at least a minimum specified level.
Net worth	Subsidiary fixed charge coverage	Subsidiaries are required to maintain a minimum ratio of net income to fixed charges
	Net earnings test issuance	To issue additional debt the issuer must have achieved or maintained certain profitability levels. This test is a variations of the (more common) fixed coverage tests
	Maintenance net worth	Issuer must maintain a minimum specified net worth
Rating decline	Declining net worth	If issuer's net worth (as defined) falls below minimum level, certain bond provisions are triggered
	Rating decline trigger put	A decline in the credit rating of the issuer (or issue) triggers a bond holder put provision

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